

What Is Claimed Is:

1 1. A method for facilitating instant failover during packet routing by
2 employing a flooding protocol to send packets between a source and a destination,
3 the method comprising:
4 receiving a packet containing data at an intermediate node located between
5 the source and the destination;
6 wherein the packet is received from a first neighboring node;
7 determining whether the packet has been seen before at the intermediate
8 node; and
9 if the packet has not been seen before, forwarding the packet to
10 neighboring nodes of the intermediate node.

1 2. The method of claim 1, wherein forwarding the packet to
2 neighboring nodes involves forwarding the packet to all neighboring nodes except
3 the first neighboring node from which the packet was received.

1 3. The method of claim 1, wherein determining whether the packet
2 has been seen before involves examining a sequence number, S_R , contained within
3 the packet to determine whether the sequence number has been seen before.

1 4. The method of claim 3, wherein the sequence number includes one
2 of:
3 a sequence number inserted into a payload of the packet;
4 a sequence number located within an Internet Protocol (IP) header of the
5 packet; and
6 a sequence number located within a layer 4 header of the packet.

1 5. The method of claim 3, wherein examining the sequence number
2 involves looking up a highest received sequence number, S_H , stored at the
3 intermediate node based upon the source of the packet.

1 6. The method of claim 3, wherein examining the sequence number
2 involves looking up a highest received sequence number, S_H , stored at the
3 intermediate node based upon the source and the destination of the packet.

1 7. The method of claim 3, wherein determining whether the packet
2 has been seen before involves examining a record, R , indicating which of N
3 possible sequence numbers preceding a highest received sequence number, S_H ,
4 have been seen before.

1 8. The method of claim 3, wherein determining whether the packet
2 has been seen before involves:
3 looking up a highest received sequence number, S_H ;
4 if $S_R > S_H$,
5 overwriting S_H with S_R ,
6 updating a record, R , indicating which of N possible
7 sequence numbers preceding S_H have been seen before, and
8 forwarding the packet to the neighboring nodes;
9 if $S_H - N > S_R$, discarding the packet; and
10 if $S_H \geq S_R \geq S_H - N$, then
11 if R indicates that S_R has been seen before, discarding the
12 packet, and
13 if R indicates the packet has not been seen before,

1 updating R to indicate that S_R has been seen,
2 and
3 forwarding the packet to the neighboring
4 nodes.

1 9. The method of claim 8, wherein the record, R , is a bit vector of size
2 N .

1 10. A computer-readable storage medium storing instructions that
2 when executed by a computer cause the computer to perform a method for
3 facilitating instant failover during packet routing by employing a flooding
4 protocol to send packets between a source and a destination, the method
5 comprising:
6 receiving a packet containing data at an intermediate node located between
7 the source and the destination;
8 wherein the packet is received from a first neighboring node;
9 determining whether the packet has been seen before at the intermediate
10 node; and
11 if the packet has not been seen before, forwarding the packet to
12 neighboring nodes of the intermediate node.

1 11. The computer-readable storage medium of claim 10, wherein
2 forwarding the packet to neighboring nodes involves forwarding the packet to all
3 neighboring nodes except the first neighboring node from which the packet was
4 received.

1 12. The computer-readable storage medium of claim 10, wherein
2 determining whether the packet has been seen before involves examining a
3 sequence number, S_R , contained within the packet to determine whether the
4 sequence number has been seen before.

1 13. The computer-readable storage medium of claim 12, wherein the
2 sequence number includes one of:
3 a sequence number inserted into a payload of the packet;
4 a sequence number located within an Internet Protocol (IP) header of the
5 packet; and
6 a sequence number located within a layer 4 header of the packet.

1 14. The computer-readable storage medium of claim 12, wherein
2 examining the sequence number involves looking up a highest received sequence
3 number, S_H , stored at the intermediate node based upon the source of the packet.

1 15. The computer-readable storage medium of claim 12, wherein
2 examining the sequence number involves looking up a highest received sequence
3 number, S_H , stored at the intermediate node based upon the source and the
4 destination of the packet.

1 16. The computer-readable storage medium of claim 12, wherein
2 determining whether the packet has been seen before involves examining a record,
3 R , indicating which of N possible sequence numbers preceding a highest received
4 sequence number, S_H , have been seen before.

1 17. The computer-readable storage medium of claim 12, wherein
2 determining whether the packet has been seen before involves:
3 looking up a highest received sequence number, S_H ;
4 if $S_R > S_H$,
5 overwriting S_H with S_R ,
6 updating a record, R , indicating which of N possible
7 sequence numbers preceding S_H have been seen before, and
8 forwarding the packet to the neighboring nodes;
9 if $S_H - N > S_R$, discarding the packet; and
10 if $S_H \geq S_R \geq S_H - N$, then
11 if R indicates that S_R has been seen before, discarding the
12 packet, and
13 if R indicates the packet has not been seen before,
14 updating R to indicate that S_R has been seen,
15 and
16 forwarding the packet to the neighboring
17 nodes.

1 18. The computer-readable storage medium of claim 17, wherein the
2 record, R , is a bit vector of size N .

1 19. An apparatus that facilitates instant failover during packet routing
2 by employing a flooding protocol to send packets between a source and a
3 destination, the apparatus comprising:
4 a receiving mechanism that is configured to receive a packet containing
5 data at an intermediate node located between the source and the destination;
6 wherein the packet is received from a first neighboring node;

7 a determination mechanism that is configured to determine whether the
8 packet has been seen before at the intermediate node; and
9 a forwarding mechanism that is configured to forward the packet to
10 neighboring nodes of the intermediate node if the packet has not been seen before.

1 20. The apparatus of claim 19, wherein the forwarding mechanism is
2 configured to forward the packet to all neighboring nodes except the first
3 neighboring node from which the packet was received.

1 21. The apparatus of claim 19, wherein the determination mechanism
2 is configured to examine a sequence number, S_R , contained within the packet to
3 determine whether the sequence number has been seen before.

1 22. The apparatus of claim 21, wherein the sequence number includes
2 one of:
3 a sequence number inserted into a payload of the packet;
4 a sequence number located within an Internet Protocol (IP) header of the
5 packet; and
6 a sequence number located within a layer 4 header of the packet.

1 23. The apparatus of claim 21, wherein the determination mechanism
2 is configured to look up a highest received sequence number, S_H , stored at the
3 intermediate node based upon the source of the packet.

1 24. The apparatus of claim 21, wherein the determination mechanism
2 is configured to look up a highest received sequence number, S_H , stored at the
3 intermediate node based upon the source and the destination of the packet.

1 25. The apparatus of claim 21, wherein the determination mechanism
2 is configured to examine a record, R , indicating which of N possible sequence
3 numbers preceding a highest received sequence number, S_H , have been seen
4 before.

1 26. The apparatus of claim 21, wherein the determination mechanism
2 is configured to:
3 look up a highest received sequence number, S_H ;
4 if $S_R > S_H$, to
5 overwrite S_H with S_R ,
6 update a record, R , indicating which of N possible sequence
7 numbers preceding S_H have been seen before, and to
8 forward the packet to the neighboring nodes;
9 if $S_H - N > S_R$, to discard the packet; and
10 if $S_H \geq S_R \geq S_H - N$, to
11 discard the packet, if R indicates that S_R has been seen
12 before, and to
13 update R to indicate that S_R has been seen, and to forward
14 the packet to the neighboring nodes, if R indicates the packet has
15 not been seen before.

1 27. The apparatus of claim 26, wherein the record, R , is a bit vector of
2 size N .